

April 12, 2005

10 CFR 50.73

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop OWFN, P1-35
Washington, D.C. 20555-0001

Dear Sir:

**TENNESSEE VALLEY AUTHORITY - BROWNS FERRY NUCLEAR PLANT (BFN) -
UNIT 3 - DOCKET 50-296 - FACILITY OPERATING LICENSE DPR-68 -
LICENSEE EVENT REPORT (LER) 50-296/2005-001-00**

The enclosed report provides details of an automatic reactor scram caused by a simultaneous false trip signal generated to the main generator circuit breaker, switchyard circuit breakers, and a main generator trip. This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A), as an event that resulted in an automatic actuation of the systems listed in paragraph (a)(2)(iv)(B) (i.e., Reactor Protection System including: reactor scram or reactor trip, and general containment isolation signals affecting containment isolation valves in more than one system).

There are no commitments contained in this letter.

Sincerely,

Original signed by:

M. D. Skaggs

cc: See page 2

U.S. Nuclear Regulatory Commission
Page 2
April 12, 2005

Enclosure

cc (Enclosure):

(Via NRC Electronic Distribution)

Ms. Eva Brown, Project Manager
U.S. Nuclear Regulatory Commission
(MS 08G9)
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852-2739

Ms. Margaret Chernoff, Project Manager
U.S. Nuclear Regulatory Commission
One White Flint, North
(MS 08G9)
11555 Rockville Pike
Rockville, Maryland 20852-2739

Mr. Stephen J. Cahill, Branch Chief
U.S. Nuclear Regulatory Commission
Region II
Sam Nunn Atlanta Federal Center
61 Forsyth Street, SW, Suite 23T85
Atlanta, Georgia 30303-8931

NRC Resident Inspector
Browns Ferry Nuclear Plant
10833 Shaw Road
Athens, Alabama 35611-6970

U.S. Nuclear Regulatory Commission
Page 3
April 12, 2005

TEA:DTL:JWD:BAB

Enclosure

cc (Enclosure):

A. S. Bhatnagar, LP 6A-C
J. C. Fornicola, LP 6A-C
R. G. Jones, NAB 1A-BFN
K. L. Krueger, POB 2C-BFN
R. F. Marks, PAB 1C-BFN
F. C. Mashburn, BR 4X-C
N. M. Moon, LP 6A-C
J. R. Rupert, NAB 1A-BFN
K. W. Singer, LP 6A-C
M. D. Skaggs, PAB 1E-BFN
E. J. Vigluicci, ET 11A-K
NSRB Support, LP 5M-C
EDMS WT CA - K
LEREvents@inpo.org

S:\lic\submit\lers\U3 LER 2005-001.doc

LICENSEE EVENT REPORT (LER)

(See reverse for required number of
digits/characters for each block)

Estimated burden per response to comply with this mandatory collection request: 50 hours. Reported lessons learned are incorporated into the licensing process and fed back to industry. Send comments regarding burden estimate to the Records and FOIA/Privacy Service Branch (T-5 F52), U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, or by Internet e-mail to infocollect@nrc.gov, and to the Desk Officer, Office of Information and Regulatory Affairs, NEOB-10202, (3150-0104), Office of Management and Budget, Washington, DC 20503. If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

1. FACILITY NAME
Browns Ferry Unit 3**2. DOCKET NUMBER**
05000296**3. PAGE**
1 OF 6**4. TITLE**

Automatic Reactor Scram Due to False Main Transformer Differential Signal

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
02	11	2005	2005-001-00			04	12	2005	none	N/A
9. OPERATING MODE 1			11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check all that apply)							
10. POWER LEVEL 100			20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(i)(C)		50.73(a)(2)(vii)	
			20.2201(d)		20.2203(a)(3)(ii)		50.73(a)(2)(ii)(A)		50.73(a)(2)(viii)(A)	
			20.2203(a)(1)		20.2203(a)(4)		50.73(a)(2)(ii)(B)		50.73(a)(2)(viii)(B)	
			20.2203(a)(2)(i)		50.36(c)(1)(i)(A)		50.73(a)(2)(iii)		50.73(a)(2)(ix)(A)	
			20.2203(a)(2)(ii)		50.36(c)(1)(ii)(A)		X 50.73(a)(2)(iv)(A)		50.73(a)(2)(x)	
			20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(v)(A)		73.71(a)(4)	
			20.2203(a)(2)(iv)		50.46(a)(3)(ii)		50.73(a)(2)(v)(B)		73.71(a)(5)	
20.2203(a)(2)(v)		50.73(a)(2)(i)(A)		50.73(a)(2)(v)(C)		OTHER				
20.2203(a)(2)(vi)		50.73(a)(2)(i)(B)		50.73(a)(2)(v)(D)		specify in Abstract below or in NRC Form 366A				

12. LICENSEE CONTACT FOR THIS LERNAME
James W. Davenport, Licensing Engineer, Licensing and Industry AffairsTELEPHONE NUMBER (Include Area Code)
256-729-2690**13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT**

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX

14. SUPPLEMENTAL REPORT EXPECTED☐ YES (if yes, complete 15. EXPECTED SUBMISSION DATE)☒ NO**15. EXPECTED SUBMISSION DATE**

MONTH	DAY	YEAR

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)

At 1629 hours Central Standard Time on February 11, 2005, the Unit 3 reactor scrambled from 100% power. The scram was caused by a simultaneous false trip signal generated to the main generator circuit breaker 234, switchyard circuit breakers 5264 and 5268, and a main generator trip. This signal was generated when a PK block (disconnect device 26W), which had been pulled as part of a clearance for breaker 5264, was re-inserted as part of a switching order from the Load Dispatcher for returning the breaker to service. When the PK block 26W was inserted (out of sequence of the switching order), the associated current transformer (CT) circuit was momentarily grounded resulting in a false differential. The correct sequence of the switching order was to actuate the trip cutout switches for the differential trip functions prior to inserting any of the PK blocks.

The generator trip resulted in a turbine trip and opening of the output breakers caused a power-load unbalance trip. The control valve (CV) fast closure caused the reactor to SCRAM.

All rods inserted. Reactor water level lowered, as expected, and was recovered by normal feed water flow. All expected Primary Containment Isolation System (PCIS) isolations were received along with the auto start of Control Room Emergency Ventilation (CREV), and the three Standby Gas Treatment (SGT) trains.

The root cause of this event was determined to be personnel error, in that the Operator (Utility Licensed) failed to follow the task sequence identified in the switching order.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 3	05000296	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2 OF 6
		2005	-- 001	-- 00	

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

I. PLANT CONDITION(S)

During this event Unit 3 was in Mode 1 at approximately 3458 megawatts thermal (100 percent reactor power). Unit 1 was shutdown and defueled and was unaffected by the event. Unit 2 was also in Mode 1 at approximately 3458 megawatts thermal (100 percent power) and was unaffected by this event.

II. DESCRIPTION OF EVENT

A. Event:

At 1629 hours Central Standard Time on February 11, 2005, the Unit 3 reactor scrambled from 100% power. The scram was caused by a simultaneous false trip signal generated to the main generator circuit breaker 234, switchyard circuit breakers 5264 and 5268, and a main generator trip. The trip occurred when a PK block (disconnect device 26W), which had been pulled as part of a clearance for breaker 5264, was re-inserted as part of switching order No. 93 for returning the breaker to service. When the PK block was inserted (out of sequence of the switching order), the associated current transformer (CT) circuit was momentarily grounded resulting in a false differential signal. The correct sequence of the switching order was to actuate the trip cutout switches for the differential trip functions prior to inserting any of the PK blocks.

The generator trip resulted in a turbine trip and opening of the output breakers caused a power-load unbalance trip. The control valve fast closure caused the reactor SCRAM.

All rods inserted. Reactor water level lowered, as expected, and was recovered by normal feed water flow. All expected Primary Containment Isolation System (PCIS) isolations [Group 2 (Residual Heat Removal (RHR) Shutdown Cooling (S/D Cooling)), Group 3 Reactor Water Cleanup (RWCU), Group 6 (Ventilation), and Group 8 Traversing Incore Probe (TIP)] were received along with the auto start of Control Room Emergency Ventilation (CREV), and the three Standby Gas Treatment (SGT) trains.

This report is submitted in accordance with 10 CFR 50.73(a)(2)(iv)(A), as an event that resulted in an automatic actuation of the systems listed in paragraph (a)(2)(iv)(B) (i.e., Reactor Protection System including: reactor scram or reactor trip, and general containment isolation signals affecting containment isolation valves in more than one system).

B. Inoperable Structures, Components, or Systems that Contributed to the Event:

None

C. Dates and Approximate Times of Major Occurrences:

February 11, 2005 1600 hours CST Unit Supervisor (Utility Licensed), responsible for areas out side of the powerhouse, was given switching order No. 93, initiated by the TVA Load Dispatcher in Chattanooga, to perform.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 3	05000296	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	3 OF 6
		2005	-- 001	-- 00	

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)**C. Dates and Approximate Times of Major Occurrences (continued)**

February 11, 2005 1629 hours CST Unit Supervisor (Utility Licensed) replaced PK block disconnect device (26W)

Relays 387T A and C Phases tripped due to main transformer differential

Relay 386tx tripped

Turbine tripped (breaker 5268 and breaker 234 tripped)

500Kv lost to Unit 3

Power-load unbalance trip

Reactor Scram due to control valve fast closure

February 11, 2005 1658 hours CST Scram reset

D. Other Systems or Secondary Functions Affected

None

E. Method of Discovery

This event was immediately apparent to the operating crew through numerous indications and alarms in the Unit 3 Control Room.

F. Operator Actions

Operations personnel responded to the event in accordance with applicable plant procedures.

G. Safety System Responses

All rods inserted. Reactor water level lowered, as expected, and was recovered by normal feed water flow. All expected Primary Containment Isolation System (PCIS) isolations [Group 2, Residual Heat Removal shutdown cooling (RHR S/D Cooling)), Group 3, Reactor Water Cleanup (RWCU), Group 6 (Ventilation), and Group 8, Traversing Incore Probe (TIP)] were received along with the auto start of Control Room Emergency Ventilation (CREV) and the three Standby Gas Treatment trains.

III. CAUSE OF THE EVENT**A. Immediate Cause**

The immediate cause of this event was the insertion of the PK block (disconnect device 26W) out of sequence from the instructions given in switching order No. 93 provided by the TVA load dispatcher.

B. Root Cause

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 3	05000296	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	4 OF 6
		2005	-- 001	-- 00	

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

Personnel error, in that the Operator (Utility Licensed) failed to follow the task sequence identified in the switching order (procedure noncompliance).

C. Contributing Factors

Infrequency of task performance

Less rigor placed on switching orders than on station generated clearance orders, including:

- No formal Pre-job Briefing that discuss risk significance of work to be performed
- Peer checker not assigned

Significant differences between TVA Nuclear's clearance order process and TVA Load Dispatcher's switching order process, i.e., TVAN's clearances do not require pulling all tags prior to restoring equipment – switching orders do.

Identification, discussions, and the addition of barriers has not been managed adequately to prevent errors during the performance of critical evolutions.

IV. ANALYSIS OF THE EVENT

At 1629 hours Central Standard Time on February 11, 2005, the Unit 3 reactor scrammed from 100% power. The scram was caused by a simultaneous false trip signal generated to the main generator circuit breaker 234, switchyard circuit breakers 5264 and 5268, and a main generator trip. The trip occurred when a PK block (disconnect device 26W), which had been pulled as part of a clearance for breaker 5264 was re-inserted as part of switching order No. 93 for returning the breaker to service. When the PK block was inserted (out of sequence for the switching order) the associated CT circuit was momentarily grounded resulting in a false differential. The correct sequence of the switching order was to actuate the trip cutout switches for the differential trip functions prior to inserting any of the PK blocks.

The generator trip resulted in a turbine trip and opening of the output breakers caused a power-load unbalance trip. The control valve fast closure caused the reactor SCRAM.

All rods inserted. Reactor water level lowered, as expected, and was recovered by normal feed water flow. All expected PCIS isolations, Group 2 (RHR S/D Cooling), Group 3 (RWCU), Group 6 (Ventilation), and Group 8 (TIP) were received along with the auto start of CREV and the three Standby Gas Treatment (SGT) trains.

All other plant responses, such as the responses of the feedwater level control system, turbine control system, etc. were as expected.

V. ASSESSMENT OF SAFETY CONSEQUENCES

The safety consequences of this event were not significant. Reactor scrams are an analyzed transient for which the plant is designed. Control rod insertion occurred as designed. Makeup water was recovered by normal feed water flow. The health and safety of the public was not affected by this event.

VI. CORRECTIVE ACTIONS

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 3	05000296	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	5 OF 6
		2005	-- 001	-- 00	

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)**A. Immediate Corrective Actions**

- Appropriate personnel action taken with involved personnel
- Interim Action - Operations Shift Manager to conduct the Pre-job Brief for switching orders
- Reinforce lessons learned from this event during startup simulator training.

C. Corrective Actions to Prevent Recurrence⁽¹⁾

- Evaluate future switching order activities as potential high risk/loss of generation evolutions.
- Reinforce requirement to perform formal pre-job briefings for switching order activities.
- Reinforce differences between clearance order and switching order processes during operator training.
- Nuclear Assurance will perform observations on quality and rigor of pre-job briefings site-wide.
- Develop action plan that will address and improve defense-in-depth barriers for critical evolutions/activities.
- Develop a Nuclear Safety/Generation Worksheet as a tool to help identify activities that challenge nuclear safety and generation and identify additional barriers to prevent error/plant transients.

VII. ADDITIONAL INFORMATION**A. Failed Components**

None

B. Previous LERs on Similar Events

None

C. Additional Information

Browns Ferry Corrective Action Program document PER 76599

D. Safety System Functional Failure Consideration:

No safety functions were compromised as a result of this event. Therefore, this event is not considered a safety system functional failure in accordance with NEI-99-02 in that functional capability of the overall system was not jeopardized.

⁽¹⁾ TVA does not consider these corrective actions regulatory commitments. The completion of these actions will be tracked in TVA's Corrective Action Program.

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET (2)	LER NUMBER (6)			PAGE (3)
Browns Ferry Nuclear Plant Unit 3	05000296	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	6 OF 6
		2005	-- 001	-- 00	

NARRATIVE (If more space is required, use additional copies of NRC Form 366A) (17)

E. Loss of Normal Heat Removal Consideration:

The condenser remained available, providing a normal heat removal path following the reactor scram. Accordingly, this event did not result in a Scram with a loss of Normal Heat Removal as defined in NEI 99-02.

VIII.COMMITMENTS

None